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SEMI-ANNUAL STATUS REPORT

Atmospheric Planetary-Wave Response to External Forcing

NASA Grant NAG 5-136

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During the first part of 1983 we have continued our progress on NASA Grant NAG 5-136, entitled "Atmospheric Planetary-Wave Response to External Forcing". The following is a brief summary of some of our activities during this period.

1. The study conducted by Adel Hanna for his Ph.D. dissertation (CSU Atmospheric Science Paper No. 360) has been refined and extended. Early in the year it was submitted for publication to the Journal of the Atmospheric Sciences. We have just learned of its acceptance for publication. A copy is attached as Appendix 1.
2. Some of the results from that study were reported at the Southern Hemisphere Meteorology Conference in Brazil during the week of July 31 - August 6, 1983. Dr. Hanna and Professor Stevens attended that conference under sponsorship of the National Science Foundation. A copy of the preprint is attached as Appendix 2.
3. Duane Stevens has been invited by the University of Warsaw and the Meteorological Service in Poland to present a series of seminars during the week of Aug. 15-19, 1983. His presentations include a report of the modeling approach and the results obtained to date.
4. A CSU Atmospheric Science Paper is in the final stages of preparation. It will give details of the numerical model, making the model more accessible to other users.

5. A paper will be presented at the Paris conference on stationary waves, to be held August 29 - September 2, 1983. We will compare the model climatology with and without mountains.

6. The CSU Institute for Computational Studies has aided our group in adapting the model to the Cyber 205. We hope this will enable us to use the Cyber 205 at GLAS.

7. Under the supervision of E.R. Reiter, Mr. Jim Bossart (M.S. candidate) is adapting the Hanna model to summertime circulation conditions for the specific purpose of studying planetary wave response to continental heat flux anomalies. Especially drought and heat wave conditions over the United States will be explored.

8. Ms. Sharon Gould-Stewart (M.S. candidate) is in the process of comparing climatological results obtained from Hanna's model with those available from the Community Climate Model at NCAR.

9. A paper by John Anderson and Duane Stevens was presented in Boston during the week of March 22-25 at the AMS Conference on Waves and Stability. We discussed the nonlinear evolution of inertial instabilities in the tropics. This work has potential theoretical implications for the symmetric GCM simulations recently reported by Goswami and Shukla.

10. This nonlinear inertial instability was submitted by Anderson and Stevens to the Journal of Geophysical Research for publication. We have not yet received any reviews. A copy is attached as Appendix 3.

References

- Anderson, J., and D.E. Stevens, 1983: Non-linear evolution of equatorial symmetric instabilities. (submitted to J. Geophys. Res., May 1983)
- Ciesielski, P. and D.E. Stevens, 1983: Development of a linear primitive equation model for tropical circulation studies. Colorado State University Atmospheric Science Paper. (in preparation)
- Hanna, A.F., E.R. Reiter, and D.E. Stevens, 1983: Short-term climatic fluctuations forced by thermal anomalies. Paper prepared for the First International Conference on Southern Hemisphere Meteorology; July 31 - August 6, 1983; Sao Jose Dos Campos, Brazil.
- Hanna, A.F., D.E. Stevens and E.R. Reiter, 1983: Short-term climatic fluctuations forced by thermal anomalies. Accepted for publication in J. Atmos. Sci., August 1983.
- Stevens, D.E. and J. Anderson, 1983: Symmetric instability of sheared zonal flows near the equator. Presented at the AMS 4th Conference on Atmospheric and Oceanic Waves and Stability, Boston, MA, March 21-25, 1983.